

Reengineering Cost Estimation using Scrum Agile Methodology

Jaswinder Singh¹, Kanwalvir Singh² and Jaiteg Singh³

¹ Department of Computer Application, IK Gujral Punjab Technical University
Kapurthala, Punjab, India
Jaswinder_luthra@yahoo.co.in

² School of Computer Science and Engineering, Baba Banda Singh Bahadur Engineering College,
Fatehgarh Sahib, Punjab, India
Kanwalvir.singh@bbsbec.ac.in

³ Department of Computer Applications, Chitkara University
Chandigarh-Patiala National Highway, Punjab, India
Jaiteg.singh@chitkara.edu.in

Abstract: Estimating the budget for developing software is one of the prime tasks for software stakeholders. Good estimation increases the customer faith and goodwill for the development company. Many estimation techniques exist for estimating the cost of the software. Estimating reengineering projects are equally important. Researchers estimated cost of Reengineering using conventional algorithmic estimation methods. They also used classical software development approaches to perform reengineering. Conventional estimation methods are suitable in an environment where requirements are predefined and fixed. Practically, these methods can not fit in today's software development environment. We need more realistic approach to estimate. Since a decade, we have witnessed a change in the Software development approaches. Now software development process is more people centric and realistic for their stakeholders. This change in process is due to Agile. Agile methodology has gained the interest of both customers as well as developers. The main objective of this research is to estimate the cost of reengineering with consensus based estimation technique of Scrum development methodology. Agile Reengineering model is also proposed for estimation and performing reengineering. Thus the research is aimed to provide a model, which not only helps in performing the reengineering estimations but also guides how to perform reengineering. Scrum approach with sprint iteration of three weeks is used to perform reengineering. Chidamber and Kemerer (CK) metric is applied to determine the complexity metrics for various classes of the software. Reengineering is performed to make the project more maintainable by reducing the CK metric complexity. Various tools used in this work include CK java Metric tool (CKJM) ver-1.9 for calculation of CK metrics suit, IBM Rational Rose ver7.5 for Unified Modeling, Rapid Minor studio ver7.1 for determining the reengineering requirements of the software.

Keywords: Software Engineering, Software Reengineering, Reengineering Cost estimation, Agile Scrum Methodology,

I. Introduction

Reengineering is aimed to improve the quality of the existing software [1]. It makes the system more maintainable and also extends the life expectancy [2]. It is essential to decide when to reengineer the system. Estimating cost and efforts are crucial to determine the feasibility of software development [3]. As we Estimate software development cost, similarly cost of reengineering should also be estimated.

Once the requirements for the reengineering of the system arise, it is required to estimate the cost needed to perform reengineering. The process of reengineering mainly includes three phases. The first phase is to analyze the existing system (Reverse Engineering), the second phase is to inculcate the required reengineering requirement (Transition) and last but not least, verify and validate the entire system (forward engineering).

Many popular algorithmic cost estimations methods exist to estimate the cost of software development like Function Point (FP), the Source line of Code (SLOC), Constructive Cost Model (COCOMO). Many authors like Sneed [4] and Sood [5] performed cost estimations for software reengineering process using conventional estimation methods.

The main problem with these existing methods is that they are not suitable in an environment where software requirements continuously keep changing. Traditional algorithmic methods are static. They worked well when software requirements are already known and fixed. So the need is to have a more realistic and flexible approach to determine the cost estimations for the reengineering process. For accurate estimations, it is essential to know what methodology will be used to perform reengineering. Use of right approach will positively affect the estimation accuracy. In this research work, Scrum approach of agile is used to